

Date: Thursday, 5/3/2007 11:34:10 AM  
 User: Kim Johnston

## Process Sheet

Customer	CU-DAR001 Dart Helicopters Services		Drawing Name	412 X-TUBE INST,LOW NARROW FWD	
Job Number	32177		Part Number	D412664105	
Estimate Number	12816		Drawing Number	D412-664 UNDER REV	
P.O. Number			Project Number	N/A	
This Issue	5/3/2007	S.O. No.	Type	LANDING GEAR	
Prsht Rev.	NC		Drawing Revision	<i>UR CHG</i>	
First Issue	/ /		Material		
Previous Run	32175		Due Date	6/1/2007	Qty: 1 Um: Each
Written By	<i>KJ 07-05-03</i>				
Checked & Approved By					
Comment	Est Rev:A New Issue 07-04-05 JLM				

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
1.0	DC	DOCUMENT CONTROL 
	Comment: DOCUMENT CONTROL Photocopy bluefile and create labels as per PPP D412-664-105 CHG001	
2.0	PACKAGING 1 	PACKAGING RESOURCE #1 
	Comment: PACKAGING RESOURCE #1 Pick Packing Kit <i>B3</i>	
3.0	D412664145 	Crosstube 412 Low 
	Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s) Crosstube 412 Low <i>B3 31596</i> Batch: _____	
4.0	AN635A 	BOLT 
	Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s) Bolt <i>M101697X</i> Batch: _____	
5.0	AN636A 	Bolt 
	Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s) Bolt <i>M102929X</i> Batch: _____	<i>2/6/07 SG</i>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes  No  DQA: LJ Date: 07/06/08  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Thursday, 5/3/2007 11:34:11 AM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 412 X-TUBE INST,LOW NARROW FWD

Job Number: 32177

Part Number: D412664105

Job Number:



Seq. #: Machine Or Operation:

Description :

6.0 MS21042L6 Nut



Comment: Qty.: 6.0000 Each(s)/Unit Total : 6.0000 Each(s)

Nut

Batch: M101660-X

7.0 AN960JD616 Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)

Washer

Batch: M103641-X

7/6/07 SP

8.0 QC4 INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

107/6/08 ① C207/06/08 ①

9.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Identify and pack for shipping as per PPP D412-664-105

ONAIT 7/6/08 ①

10.0 QC21 FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

2007/06/08 ①

Job Completion



7/6/08

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**DART**

DESIGN	<i>QP</i>	DRAWN BY	<i>QP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>AA</i>	APPROVED	<i>AA</i>	DRAWING NO.	REV. C
				D412-664-145	SHEET 1 OF 3
DATE 07.03.29				TITLE CROSSTUBE ASS'Y (412 LOW-N FWD) NTS	SCALE
A	06.12.21		NEW ISSUE		
B	07.03.01		CHG RUBBER CUSHION		
C	07.03.29		CHG CLAMP & RUBBER CUSHION LGTH.		

**RELEASED**07.04.24 *AA***PARTS LIST:**

Qty	Part Number	Description
X	D412-664-145	CROSSTUBE ASSEMBLY (412 LOW-NARROW FWD)
1	D6019-128	CROSSTUBE
1	D2856-250-842	ABRASION STRIP
2	D2893-1	SUPPORT
1	D3189-3	CHAFING SHIELD
4	D3595-063-450	RUBBER CUSHION
2	MS21920-24	CLAMP
4	MS21920-25	CLAMP (OR MS21920-26)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

**GENERAL NOTES:**

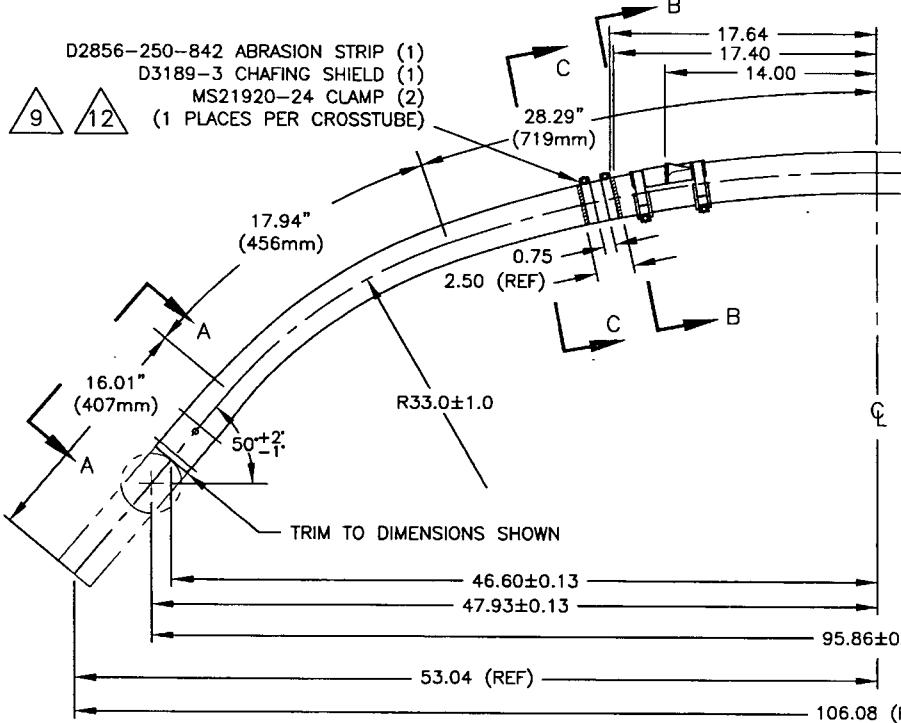
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6019-128  
FINISHED LENGTH =  $124.48 \pm 0.020$  (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR D3189-3 CHAFING SHIELD AND ASSOCIATED HARDWARE.
- 5) RUN-OFF PART, BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-XXX-YYY ABRASION STRIPS WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY NUT AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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D2856-250-842 ABRASION STRIP (1)  
 D3189-3 CHAFING SHIELD (1)  
 MS21920-24 CLAMP (2)  
 (1 PLACES PER CROSTUBE)

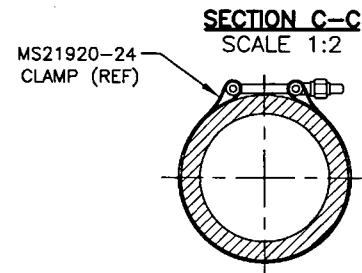
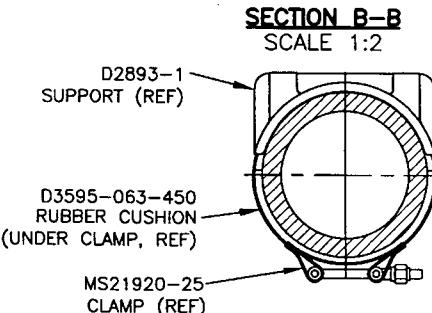
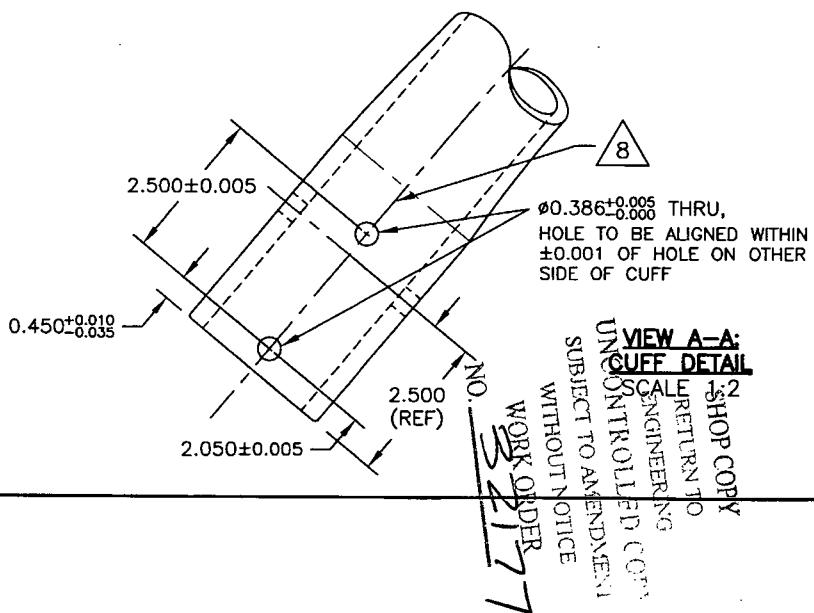


D2893-1 SUPPORT (1)  
 MS21920-25 CLAMP (2)  
 D3595-063-450 RUBBER CUSHION (2)  
 (2 PLACES PER CROSTUBE)

$\phi 0.386^{+0.005}_{-0.000}$  THRU,  
 HOLE TO BE ALIGNED WITHIN  
 $\pm 0.001$  OF HOLE ON OTHER  
 SIDE OF CUFF (TYP 2 SIDES)

**D412-664-145 BEND/ASSEMBLY  
DETAIL**

RELEASED  
07-04-24



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REV. C

SHEET 2 OF 3

07.03.29

SCALE

1:8

DESIGN *97* DRAWN BY *97*  
 CHECKED *✓* APPROVED *✓*  
 DRAWING NO.  
 D412-664-145

**DART**

DART AEROSPACE LTD.  
 HAMPSHIRE, ONTARIO, CANADA

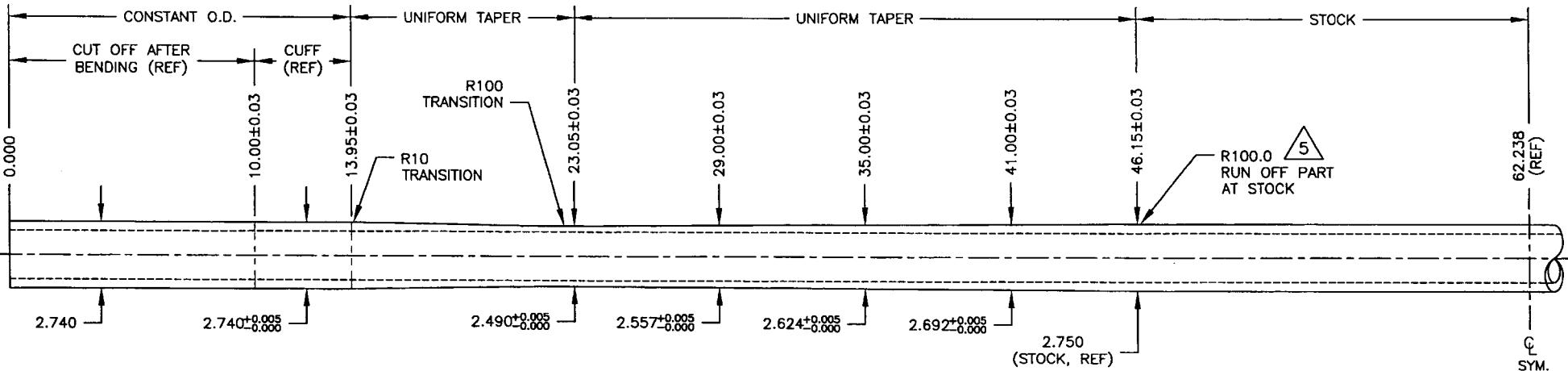
REV. C

SHEET 2 OF 3

SCALE

1:8

TITLE  
 CROSTUBE (412 LOW-NARROW FWD)



D412-664-145 MACHINING DETAIL

RELEASED  
07.04.09

NO. 32177

WORK ORDER

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DESIGN	gp	DRAWN BY	gp
CHECKED	✓	APPROVED	✓
DATE		07.03.29	

DART AEROSPACE LTD.  
HAWKSBURY, ONTARIO, CANADA

DRAWING NO. D412-664-145

REV. C

SHEET 3 OF 3

TITLE CROSSTUBE (412 LOW-NARROW FWD) 1:4

Date: Thursday, 5/3/2007 11:34:10 AM  
 User: Kim Johnston

## Process Sheet

Customer	CU-DAR001 Dart Helicopters Services		Drawing Name	412 X-TUBE INST,LOW NARROW FWD		
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Estimate Number	12816		Drawing Number	D412-664 UNDER REV		
P.O. Number	:		Project Number	N/A		
This Issue	5/3/2007	S.O. No. :	Drawing Revision	JRC		
Prsht Rev.	NC		Material	:		
First Issue	/ /	Type : LANDING GEAR	Due Date	6/1/2007	Qty:	1 Um: Each
Previous Run	32175					
Written By	:					
Checked & Approved By	:					
Comment	Est Rev:A New Issue 07-04-05 JLM					

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :	
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2.0	PACKAGING 1	PACKAGING RESOURCE #1	
		Comment: PACKAGING RESOURCE #1 Pick Packing Kit	
3.0	D412664145	Crosstube 412 Low	
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s) Crosstube 412 Low Batch: _____	
4.0	AN635A	BOLT	
		Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s) Bolt Batch: _____	
5.0	AN636A	Bolt	
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